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ABSTRACT

This study sought to examine the factors, both quantitative and qualitative, that may predict the doctoral students in the field of educational administration who will be most likely to persist to degree conferral. The study was conducted in two phases. First, a survey instrument was administered to 152 doctoral students who began a program of study during the years 1986 to 2000 at a medium-sized Midwestern university to assess their perceptions of the reasons for success (graduation) or nonsuccess. In the second phase, various independent variables, e.g., Graduate Record Examination (GRE) scores, age, undergraduate grade point average (GPA), master's degree GPA, type of institution from which baccalaureate and master's degrees were earned, undergraduate major, graduate major, and completion of the Specialist in Education degree, were subjected to regression analysis to determine which factors or combinations of factors best predicted program completion. Results show minimal differences in graduate GPA and age between the graduated and not graduated group. GRE scores showed differences, especially by gender. Students who held undergraduate degrees from baccalaureate institutions had the highest graduate rate. These same students held master's degrees from research institutions. An appendix contains the study survey. (Contains 9 tables and 30 references.) (SLD)

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An Analysis of the Factors Contributing to the Completion and Attrition Rates of Doctoral Students in Educational Administration

ED 457 779

A Paper Presentation for Midwestern Educational Research Association

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Abstract

Little published research exists on doctoral attrition, retention, and completion of degree programs. This study sought to examine the factors, both quantitative and qualitative, that may serve to predict doctoral students in the field of educational administration at the time of admission who will be most likely to persist to degree conferral. The study was conducted in two phases. First, a survey instrument was administered to 152 doctoral students who began a program of study during the years 1986 to 2000 at a medium-sized midwestern university to assess their perceptions of the reasons for success (graduation) or non-success. Second, various independent variables, e.g., GRE scores, age, undergraduate GPA, master's degree GPA, type of institution from which baccalaureate and masters' degrees were earned, undergraduate major, graduate major, and completion of the Specialist in Education degree, were subjected to regression analysis to determine which factor(s) or combinations of factors best predicted program completion. Results showed minimal differences in graduate GPA and age between the graduated and not graduated group. GRE scores showed differences, especially by gender. Students who held undergraduate degrees from baccalaureate institutions had the highest graduation rate. These same students held masters' degrees from research institutions.

An Analysis of the Factors Contributing to the Completion And Attrition Rates of Doctoral Students in Educational Administration

Perspectives and Theoretical Framework

Completion of a doctoral program in educational administration involves intensive study, concentration, and sacrifice. Selection, admission, and enrollment of students into such programs constitute sizeable investments of university resources in terms of faculty, library holdings, and other support services. Judicious decisions as to the students who are admitted and those who are not are critical to the entire process. Factors that enter into the admissions process of doctoral students must be focused upon the student's ability to complete program requirements and ultimately be awarded the doctoral degree. The question is, "What factors should be considered?"

Common features of a doctoral admissions process include some type of standardized test, e.g., the Graduate Record Examination (GRE), the student's prior academic record, letters of recommendation, previous professional experience, and perhaps some type of writing sample. GRE scores and grade point average (GPA) represent quantitative factors in the decision-making process, but other variables may be equally important. Judging a student's ability to complete the doctoral degree may include information that cannot be known until the student progresses through the program, e.g., persistence in achievement, desire. At stake in a sound doctoral admissions model that maximizes student quality and degree completion and reduces the rate of attrition is the enhancement of an institution's academic reputation and, of utmost importance for society, preparation of leaders for the educational challenges of the 21st century.

Unfortunately, there is a serious lack of attrition and retention research at the graduate level. Few studies contain an analysis of factors that can be used to predict students who are most likely to be successful, i.e., complete the degree. One of the most recent was a study by Malone, Nelson, and Nelson (2001), but this investigation focused on predicting the completion of a master's level program. Bowen and Rudenstine wrote, "surprisingly little has been written about the general pattern of [graduate student] completion rates" (p. 107). Isaac (1993) found no national databases and very little institution-specific data on attrition or retention at the graduate level. Most retention studies have been targeted at the undergraduate population, and no equivalent investigations have been made for post-baccalaureate students, especially at the doctoral level (Bowen & Rudenstine, 1992; Gunn & Sanford, 1988; Isaac, 1993). Tinto (1987/1993) offered an important reason why less research on attrition has been conducted at the graduate level than at the undergraduate level.

He wrote, "Research on graduate attrition has not been guided either by a comprehensive model or theory of graduate persistence or by the methodological strategies that have been successfully employed in the study of undergraduate persistence" (p. 231).

Other reasons have been given for the dearth of graduate-level attrition and retention studies. Hartnett and Katz (1977) believed that because motivation and task-orientedness could be taken for granted with graduate students, institutions have seen no compelling need to pay much attention to graduate students or the processes by which they become scholars. While this may still be the prevailing attitude nearly a quarter century later, institutions should be concerned about doctoral attrition. In contrast to undergraduate and master's level students, doctoral students more often reflect the scholarly image of the academy (Hartnett & Katz, 1977). Since universities also invest considerable resources in doctoral preparation, attrition has significant implications for efficient use of those resources as well as for individual students (Kluever, 1997; National Science Foundation, 1998).

Researchers who have published studies on doctoral retention have focused on different aspects of the doctoral experience. One of the most critical factors in completing the doctorate is the adequate preparation of students for research. Brewer, Douglas, Facer, and O'Toole (1999) found that engaging students in research that culminates in scholarly publications and employing productive faculty members are two of the three most important components in training doctoral students for the rigorous inquiry and writing required for the dissertation. In addition, research conducted collaboratively with faculty members not only fosters dissertation progress it decreases the time to degree completion (Nerad & Cerny, 1993). Similarly, Faghihi, Rakow, and Ethington (1999) found that students' relationships with their advisors and committee members in conjunction with their self-efficacy in research significantly contributed to doctoral success. Other factors that facilitate doctoral completion are the utilization of faculty as role models and mentors (Baird, 1992; Faghihi, et. al., 1999), opportunities for financial assistance (Nerad & Cerny, 1993; Brewer, et. al., 1999), and close social and academic interaction with fellow graduate students (Baird, 1992).

Since Isaac's study in 1993, researchers have begun to investigate graduate-level attrition and retention on a wider scale. Most notably, Bair and Haworth (1999) compiled findings on 118 research studies on doctoral attrition and retention conducted between 1970 and 1998. These studies affirmed Isaac's assertion that no national databases exist on graduate attrition compared to completion because the studies utilized in their meta-synthesis focused on doctoral attrition at

specific institutions. Their findings included: 1) attrition and persistence rates vary widely by field of study, and even more widely by program of study; 2) departmental culture affects doctoral student persistence; 3) difficulties with the dissertation relate to attrition; 4) academic achievement indicators, except for GRE scores, are not effective predictors of degree completion; 5) employment and financial factors are poor indicators of persistence; and, 6) retention rates vary widely among institutions.

Just what is graduate student attrition? Traditional calculations include the percentage of fully admitted students who do not complete their degree programs. Admittedly, describing attrition is imprecise and when one reviews the literature on the subject, there is no agree-upon definition of the term. The very nature of graduate education renders the assessment of attrition difficult (Isaac, 1993). If a university has a doctoral program that allows students to begin graduate study without having a master's degree and some students obtain the master's and drop out of the doctoral program, are those students counted in attrition figures? Are they true dropouts? There may situations where a person fails to finish a doctoral program for justifiable reasons. In such cases, is attrition an appropriate term?

While a high attrition rate may be perceived by both perspective students and the general public as a failure of the university's role to meet student needs (Pauley, Cunningham, & Toth, 1999), some actually view a certain amount of attrition as a societal gain rather than a loss. High attrition rates may reflect neither poor institutional performance nor student quality. One informal estimate postulated that as many as 20 to 40 percent of all doctoral candidates who do not complete a degree program may, in fact, have transferred to pursue a degree in another field or left academic work to take employment that utilizes their graduate education. Because these individuals go on to productive lives in another setting, they probably should not be included in attrition statistics (National Science Foundation, 1998). The issues posed here may initially seem simple; however, those who have been involved in doctoral programs quickly discover such issues become complicated when the actual administration occurs.

Significance of the Study

Only a few institutions have published internal studies on doctoral attrition in educational administration programs (Lindle, 1998; Nagi, 1975; Pauley, Cunningham & Toth, 1999; Sigafus, 1998). Since Bair and Haworth (1999) found that retention rates vary widely by institution and it has been asserted that future directions for research should be focused at the departmental and

program level (National Science Foundation, 1998), it is clear that institutional studies are needed. It is also evident that results from other institutions cannot be generalized beyond their own campuses. With this being the case, the current emphasis on raising standards for educational programs entails a need for more in depth understanding of students who have entered and/or completed programs, e.g., success of graduates, types of positions held by graduates, numbers completing the programs, and numbers enrolled for program sustainability.

The expenses and encumbrances of a doctoral program are two-fold: on the individual student and on the institution. The study of attrition in doctoral programs is important because the costs of admissions, advising, planning, and running of the programs is not recoverable. The costs of those students who do not complete are all a part of the overall expense of conducting a doctoral program (Pauley, Cunningham, & Toth, 1999). Students who drop out may remove resources that could be used for incoming students (Calder, McKay, & Nelson, 1977). Therefore, a determination of program completion percentage is crucial. Currently, program completion rates for doctoral students range from 40 to 60 percent (Bair & Haworth, 1999). Is this good? Is it too high? Is it too low? What are reasonable completion rates for doctoral programs? Is attrition all bad? Since no national standard exists that indicates what is acceptable and what is not, and actual academic records have not been used to determine the existence of factors or patterns of factors that have a pronounced effect upon program completion, there is no way to provide a national answer to the questions queried above.

Why, then, should attrition and retention research be conducted? Concerns in addition to those noted above are also important. Increasingly in the United States, positions of leadership and power require professional school or graduate study (Hite, 1985). Educational communities that have a shortage of qualified candidates to fill positions face a growing need for faculty and administrators with doctoral credentials (National Research Service, 1998; Pauley, Cunningham, & Toth, 1999). Besides a rigorous screening process for all applicants, an understanding of doctoral completion and attrition is an absolute necessity if institutions are serious about improving the quality of their programs and providing future educational leaders. The institutional perspective cannot be ignored. Policymakers have a salient interest in reducing the economic costs of attrition, and accountability demands that universities evade the perception of fiscal inefficiency (Pauley, Cunningham, & Toth). Findings of attrition research will guide administrators in making decisions regarding the allocation of financial resources to graduate students and preserve the university's role

as a resource for new knowledge, innovation, and educated workers. For students, accurate attrition and retention information can help them avoid the economic and psychological ramifications of failure to complete degree programs (National Science Foundation, 1998).

Currently, program completion rates for undergraduate students must be reported. This mandate is a requirement under the Students Assistance General Provision Act (effective with the 1995 academic year). The National Science Foundation (1998) projected the requirements of the Act to be applied to graduate education. It is a reasonable projection. Accountability requires the assessment of the quality and success of an institution's academic programs, and careful analysis of completion and attrition data will assist in institutional appraisal (Pauley, Cunningham, & Toth, 1999).

Research Design and Methodology

This study was conducted at a doctoral degree granting university with an average graduate enrollment of 2,600. The total subject pool in the study was 168 graduate students admitted to the doctoral program (Ed.D.) in educational administration for the years 1986-2000. Investigators chose the year 1986 because this was the first year that scores from the Graduate Record Examination, one of the independent variables examined here, were required for doctoral admission. Departmental admission requirements included a minimum of a 3.20 grade point average (on a 4.0 scale) on the Master's Degree and a combined score of 1000 on the verbal and quantitative portions of the GRE or a total score of 1500 on all subsections (these are preferable scores; however, students are admitted with a combined score of 1000 on any two of the subscales). Students who did not meet these minimum standards could be granted probationary admission and could be considered for full admission upon completion of 12 semester hours with a minimum 3.20 grade point average. Of the total number admitted to doctoral study, sixteen students never began the program; thus, data were available for 152 students, 66 of whom have graduated, 54 have dropped out of the program, and 32 are still actively pursuing the degree.

The authors sought to investigate attrition, retention and program completion of these doctoral students and how best to determine at the time of admission which students were most likely to achieve success, i.e., degree conferral. Degree completion, the sole dependent variable in this study, is viewed as the most defensible and viable definition of success (Case & Richardson, 1990; Goldberg & Alliger, 1992; Holmes & Beishline, 1996; House & Johnson, 1993a; Isaac, 1993;

Mitchelson & Hoy, 1984; Nelson, Nelson, & Malone, 2000; Pauley, Cunningham, & Toth, 1999; Williams & Harlow, 1970).

First Phase of the Study

The study was conducted in two phases: 1) an analysis of program data to determine the variables that influenced program completion, and 2) a survey of enrolled doctoral students. First, in order to determine which of the variables would predict successful completion of the Ed.D. degree, a backstep logistic regression model was utilized. This modeling process begins by including all predictor variables and then eliminating those variables that do not add significantly to the prediction of the dependent variable. In this study, the predictor variables were divided into two types: continuous and categorical. The continuous predictor variables included the following: 1) GRE verbal score (GREV); 2) GRE quantitative score (GREQ); 3) undergraduate GPA (UGPA); 4) Master's degree GPA (MGPA); and the total number of years that elapsed from the time the student finished the undergraduate degree to the time the student began the doctoral program. In addition to these variables, the GRE verbal score and the GRE quantitative score were combined conjunctively (in a model proposed by Einhorn, 1971) with the UGPA and the MGPA to produce the following variables: 1) GREV x UGPA; 2) GREQ x UGPA; 3) GREV x MGPA; 4) GREQ x MGPA. The GRE analytic score was not included in the regression analysis because a large number of students did not submit results from this portion of the examination.

The categorical predictor variables included the following: 1) gender; 2) the Carnegie Classification (baccalaureate, masters, doctoral, or research) of the institution from which the student received the undergraduate degree; 3) the Carnegie Classification of the institution from which the student received the master's degree; and 4) whether the student entered the doctoral program with the Ed.S. degree (a graduate specialist degree program that requires 30 semester hours beyond the master's degree) or received the Ed.S. degree while working on the doctoral program or never received the Ed.S. degree.

In order to use the categorical predictor variables, contrasts were utilized. The type of contrast employed was a deviation contrast where one category is selected and each of the other categories is compared with the selected category. For the variable representing the Carnegie Classification, a contrast matrix was established so that each undergraduate and graduate institution was compared with the doctoral granting institution. For the variable representing the Ed.S. degree, the categories of possessing the Ed.S. before starting the doctoral program, or obtaining the Ed.S.

after enrolling in the doctoral program were compared with the category of not possessing the Ed.S. degree.

Regression analysis was used in this study rather Fisher's discriminant function because logistic regression is more appropriate when the subjects are being classified into just two groups. Another reason for utilizing regression analysis instead of the discriminant function is that the latter assumes that the independent variables each have a distribution that is normal. Since some of the independent variables were categorical, e.g., the variables representing the type of institution from which the student earned the baccalaureate and masters' degrees, the academic areas of the undergraduate and graduate majors, and gender, it was deemed more appropriate to use logistic regression which is less sensitive to the restriction of normality.

The method used for the logistic regression was the log likelihood ratio method. The model was re-estimated by eliminating each variable one at a time. Variables that did not cause a change in the log likelihood ratio were eliminated from the model. This model is better than eliminating variables based on the Wald statistic (SPSS Reference Guide).

Second Phase of the Study

For the second phase, a survey instrument was administered to 144 students who began the doctoral program. The researchers determined the number 144 by deducting the names of those students who had been admitted but never started (16), those who were deceased (2), and those for whom no accurate addresses could be obtained (6). The purpose of the survey was to assess student perceptions of the reasons for their success or non-success in the doctoral program. Development of the instrument involved several iterations to provide precise language that eliminated ambiguous statements. A faculty member knowledgeable in survey research critiqued the instrument for clarity and purpose. The instrument was then administered to selected faculty who had expertise in psychometrics. The suggestions from this latter group were then incorporated into the final version that was administered to the students.

The survey instrument consisted of 56 items (see Appendix A for the survey instrument). Included were: 1) demographic items, e.g., age, marital status, employment status; and, 2) items assessing student perceptions of their program experience requiring responses in several formats, e.g., "Yes" or "No", multiple choice, and Likert scale. The Likert item responses were "Strongly Agree" (SA), "Agree" (A), "Not Applicable" (NA), "Disagree" (D), and "Strongly Disagree" (SD). Survey data were analyzed using factor analysis, analysis of variance, and chi square.

Program Data Results

As noted above, 66 of the 152 students who began the doctoral program in educational administration graduated. Thirty-two are actively pursuing the degree, but 54 (or 41.8%) dropped out. This dropout rate is comparable to studies over the last half century that have shown an attrition rate of between 40 and 60 percent (Bair & Haworth, 1999). In Table 1 the descriptive data of the predictor variables between those who completed the doctoral program with those who did not are provided.

Table 1

Comparison of Graduates and Non-Graduates

Measure	Graduates			Non-Graduates		
	All	Male (39)	Female (27)	All	Male (36)	Female (18)
UGPA	2.98	2.95	3.02	3.08	3.02	3.20
MA GPA	3.70	3.65	3.76	3.67	3.65	3.70
Verbal	531	525	540	525	524	526
Quantitative	544	545	542	577	595	482
Analytical	538	541	532	532	554	491
Age at Start	40.5	39.8	41.4	40.8	40.3	41.8
Final GGPA	3.90	3.88	3.92	3.81	3.80	3.82
Yrs from BA to MA	3.0	2.8	3.2	3.5	3.9	2.7
Yrs from MA to EdD	10.6	10.4	10.9	11.2	10.6	12.2
Yrs from BA to EdD	17.4	16.1	19.3	17.0	16.8	17.2
% With Asstships	70.0	61.5	85.7	30.0	8.5	14.3
Average Number of Hours Completed				24.4	24.7	23.9
% Passed Comps				20.3	27.7	5.6
% With Proposal				3.7	5.5	0.0
by Carnegie (BA)						
Bachelor's	65.4	66.6	62.5	34.6	33.3	37.5
Master's	64.0	58.8	75.0	36.0	41.2	25.0
Doctoral	41.9	37.5	47.4	58.1	62.5	52.6
Research	57.5	50.0	70.0	42.3	50.0	30.0
% by Carnegie (MA)						
Bachelor's	N/A	N/A	N/A	N/A	N/A	N/A
Master's	52.9	47.6	61.5	47.1	52.4	38.5
Doctoral	50.0	47.1	54.2	50.0	52.9	45.8
Research	66.7	63.2	75.0	33.3	36.8	25.0

Interesting differences were noted between graduates and non-graduates and between males and females. In the overall population some quantitative predictor variables (MGPA, GREV, GREA, Final GPA) were higher for students who completed the doctoral program than for those who did not; however, other quantitative predictor variables, UGPA and GREQ, were higher for the non-graduates. Little difference was seen between these two groups concerning age at admission and time from the baccalaureate degree to admission to the doctoral program. In addition, the highest rate of completion of the doctoral program was for those who earned the undergraduate degree from baccalaureate institutions (except for females for which it was the masters' institutions) or the master's degree from research institutions.

The independent variables that remained in the regression equation and thus served as important predictors were whether or not the student earned the Ed.S. degree, the Carnegie classification of the undergraduate institution, and the Master's degree grade point average (see Table 2).

Table 2

Values of Variables in Ordered Rank for the Logistic Regression Equation for Degree Completion

Variable	Beta	Significance rank
Ed.S. Degree (overall)		1
Contrast (degree after entering Ed.D. with not having Ed.S. degree)	1.83	1st significant contrast
Contrast (degree before entering Ed.D. with not having the Ed.S. degree)	-1.03	2nd significant contrast
Carnegie classification of undergrad. inst.		2
Contrast Baccalaureate with Doctoral	-.46	1st significant contrast
Contrast Masters with Doctoral	-.25	2nd significant contrast
Contrast Research with Doctoral	.07	3rd significant contrast
Master's Degree GPA	-1.39	3
Constant	3.61	

The key statistical output in the analysis was the accuracy of predicting the percentage of students who completed or did not complete the doctoral degree. If the student completed the Ed.D. degree, use of the model allowed for prediction of about 80% accuracy. However, the model was only 48% accurate in predicting that the student would not complete the degree. Table 3 shows the accuracy of the prediction rate when the logistic regression was used.

Table 3

Accuracy of the Logistic Regression Results for Predicting Program Completion or Non-Completion

		Predicted		
		Completed	Not Completed	Percentage Correct
Observed	Completed	53	13	80.03
	Not Completed	28	26	48.15
		Overall Percentage		65.83

The researchers experimented with the model and determined that if the variable representing whether or not the student completed the Ed. S. degree was removed from consideration, then other variables remained in the equation. After removal of the Ed.S. variable, the Carnegie classification of the undergraduate institution was the most predictive of degree completion. Other factors also became significant: UGPA, GRE verbal times the MGPA, and gender (see Table 4).

The fact that UGPA was not statistically significant in the overall results but remained in the equation with the elimination of the specialist degree factor raises an interesting point. It is important to remember that most doctoral programs in educational administration are post-masters' requiring teaching and/or administrative experience as prerequisites for admission. Since admission to most doctoral programs is a process that begins after the master's degree, it is rare that a student's UGPA is considered as a variable. But perhaps it should. When records for those students whose UGPA was below 2.75 (the institutional minimum requirement for admission to a master's degree program) were examined, important results emerged. Of most interest, GRE scores

varied considerably; they were higher for the male non-graduates and were notably lower for female non-graduates. For example, the difference in the quantitative and analytical GRE scores between female graduates and female non-graduates is approximately 130 and 80, respectively. Regarding age, females who did not graduate tended to be younger than those who completed degree requirements. In addition, for both males and females, the final graduate grade point average was lower for the non-graduated group; however, completion of the dissertation probably influenced the final GGPA since "A's" are usually the awarded grade (Malone, Nelson, & Nelson, 2001a). The order in which the variables remained in the prediction equation is displayed in Table 4.

Table 4

Ordered Ranks of Variables in the Logistic Regression Equation for Degree Completion Without Ed.S. Degree as a Variable

Variable	Beta	Significance rank
Carnegie classification of undergrad. inst.		1
Contrast Baccalaureate with Doctoral	-.37	1st significant contrast
Contrast Masters with Doctoral	-.24	2nd significant contrast
Contrast Research with Doctoral	-.02	3rd significant contrast
Undergraduate GPA	.58	2
GRE verbal x Masters GPA	-.21	3
Masters GPA	.32	4
Gender	.19	5
Constant	1.15	

With the removal of the Ed.S. variable, differences, although minimal, were also seen in the accuracy of prediction. The overall percentage of the accuracy of the logistic regression decreased slightly, but the prediction of those who did not complete the Ed.D. in both tables, while low, remained constant (see Table 5).

Table 5

Accuracy of the Logistic Regression Results for Predicting Program Completion or Non-Completion Without the Ed.S. Degree as a Variable

		Predicted		
		Completed	Not Completed	Percentage Correct
Observed	Completed	50	16	75.76
	Not Completed	28	26	48.15
		Overall Percentage		63.16

Survey Respondent Description

Ninety-two of the 144 surveys were returned for an overall return rate of 63.8%. The breakdown of the responses was as follows: 1) 30 of 39 males (76.9%) and 16 of 26 females (61.5%) who completed the doctoral program responded; and, 2) 25 of 49 males (51.0%) and 21 of 32 females (65.6%) who did not complete the doctoral program responded. An examination of the survey data revealed the following demographic information. The average age of the respondents was 39 for males and 41 for females. Most of the students were married during some or all of the years in which they were enrolled as doctoral students (males, 94.5%; females, 67.5%); however, a much higher percentage of females were single during the entire duration of their graduate study (females, 24.3%; males, 3.6%). Most of the respondents came from families where their parents' highest level of education was high school or below (mothers, 74.7%; fathers, 67.4%). Only 23% of the respondents' mothers and 25% of the respondents' fathers held a college degree.

The academic and professional backgrounds of the respondents showed interesting, although not unexpected, differences by gender. At the time the students commenced doctoral study, the percentage of males who held administrative-level positions was considerably higher than for females. The gap was greater for those who held a superintendent or assistant superintendent position (males, 21.8%; females, 5.5%) than for individuals in the principalship (males, 41.8%; females 36.1%). A larger percentage of females, however, came from the ranks of classroom

teachers (females, 36.1%; males, 16.3%). When comparing current occupations, the interval narrowed slightly in the percentages of those who held positions in the superintendency, although both males and females made gains (males 25.4%; females, 12.1%). Females, however, made greater advances in assuming principal positions (they surpassed the percentage of males--females, 42.4%; males, 32.7%). The percentages of both male and female teachers declined, although females remained in the classroom at a higher rate (females, 24.2%; males, 9.1%). Tables 6 and 7 illustrate this information and include other positions held by the doctoral students. Table 7 also shows a comparison of current positions by those who completed the Ed.D. with those who did not.

Table 6

Percentages of Initial and Current Occupations by Gender of Doctoral Students

	Initial Occupation			Current Occupation		
Occupations	All	Males	Females	All	Males	Females
Superintendency	15.3	21.8	5.5	20.5	25.4	12.1
Principalship	39.5	41.8	36.1	36.4	32.7	42.4
Teacher	24.2	16.4	36.1	14.8	9.1	24.2
Director of Educ/Curr	6.6	7.3	5.5	17.0	23.6	6.0
School Counselor	6.6	7.3	5.5	4.5	3.6	6.1
College Administrator	4.4	3.6	5.5	3.4	1.8	6.1
Student	1.1	0.0	2.8	0.0	0.0	0.0
Business	1.1	0.0	2.8	2.3	1.8	3.0
Other	1.1	1.8	0.0	0.0	0.0	0.0
Retired	0.0	0.0	0.0	1.1	1.8	0.0

Table 7

Percentages of Current Occupations by Gender of Doctoral Students for Those Who Completed and did not Complete the Ed.D. Degree

	Completed Ed.D.			Did not Completed Ed.D.		
Occupations	All	Males	Females	All	Males	Females
Superintendency	30.4	37.5	14.2	9.5	8.7	10.5
Principalship	21.7	18.7	28.6	52.4	52.2	52.6
Teacher	21.7	15.6	35.7	7.1	0.0	15.8
Director of Educ/Curr	13.0	15.6	7.1	21.4	34.8	5.3
School Counselor	2.2	3.1	0.0	7.1	4.3	10.5
College Administrator	4.3	3.1	7.1	2.4	0.0	5.4
Student	0.0	0.0	0.0	0.0	0.0	0.0
Business	4.3	3.1	7.1	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0
Retired	2.2	3.1	0.0	0.0	0.0	0.0

When the students began their doctoral study, the females averaged 12 years of teaching experience while males averaged 10. Males, however, had a greater number of years of administrative experience than females (eight and five, respectively). Interestingly, 43% of the females and nearly 15% of the males did not report having any administrative experience. Tables 8 shows the levels of teaching and administrative experience.

Table 8

Percentage of Teaching and Administrative Experience by Level and Gender

	Teaching			Administrative		
Levels of Experience	All	Males	Females	All	Males	Females
Elementary	39.1	34.5	45.9	21.7	23.6	18.9
Junior High	45.6	43.6	48.6	28.3	32.7	21.6
High School	59.8	58.2	62.2	38.0	47.3	24.3
Central Office	N/A			16.3	18.2	13.5
Superintendent	N/A			10.9	14.5	5.4
College	25.0	21.8	29.7	10.9	7.3	16.2

It is also noteworthy that the percentage of males with administrative experience was higher than for females at all levels except post-secondary.

Analysis of Survey Data

The 25 Likert scale items were grouped using an alpha factor analysis with a varimax rotation. In the event that a response was missing for an item on an individual survey, the mean response of the items on the remaining surveys was substituted for the missing response. The factor analysis produced seven factors with eigenvalues greater than one. These seven factors accounted for 69.4% of the variance among the 25 items. These items (see Appendix A) were grouped into the seven factors as follows: Factor 1 (Items 45, 44, 43, 42 and 48); Factor 2 (Items 38, 47, 37, 27, 49, and 29); Factor 3 (Items 41, 33, 26, 32, and 50); Factor 4 (Items 46, 28 and 30); Factor 5 (Items 40 and 39); Factor 6 (Items 35 and 34); Factor 7 (Items 36 and 31). After an examination of the items loading most heavily on the factors, names were assigned to the factors as follows: Factor 1: Competencies gained; Factor 2: Quality and strength of coursework; Factor 3: Involvement of students beyond the classroom; Factor 4: Academic learning opportunities; Factor 5: Cognate courses; Factor 6: Departmental participation; Factor 7: Gathering information. The loadings of these items on the seven factors are presented in the Appendix B.

Using the factor loadings, seven factor scores were calculated for each subject. These factor scores were then analyzed using a two by two analysis of variance blocking on status (completion or non completion of the degree) and sex. The results of the analysis are presented in Table 9.

A chi-square statistic was calculated to determine whether or not the percentage of female students completing the degree differed from the percentage of male students who completed the degree. The value of this statistic was 1.13 with 1 degree of freedom and was not significant. As can be seen in Table 9, the factor labeled "involvement beyond the classroom" was the only scale in which the female respondents differed from the male respondents. The fact that a great majority of the professors in the department have been and continue to be male may have contributed to this difference. This may be an indication that more female professors are needed in educational administration. There was no difference between those who completed and those who did complete the degree on this factor, nor was the interaction between gender and degree completion status significant.

The analyses of variances presented in Table 9 indicate a difference between those who completed the degree and those who did not complete the degree on three of the scales represented by the factors "Competencies gained", "Academic learning opportunities" and "Departmental participation". Since Factor 2 and Factor 5, which measured the perceived quality of the coursework in the major area and in the cognate areas, showed no differences between those who completed the degree and those who did not, the differences seem to be reflected in whether or not the student "took ownership" of his/her educational experiences. This may be good evidence that a residency requirement or some other programmatic measures are important to insure that students become a part of their education beyond just attending classes.

Table 9

Analysis of Factor Scores

Scale	Status		Gender		Status x Gender	
	F	Sig.	F	Sig.	F	Sig.
Competencies Gained	7.82	.006	1.96	.165	.100	.753
Quality and strength of coursework	.340	.561	.349	.556	.112	.739
Involvement of students beyond classroom	2.38	.126	9.02	.003	1.56	.215
Academic learning opportunities	4.52	.036	.499	.482	.165	.685
Cognate courses	.001	.981	2.60	.110	.411	.523
Departmental Participation	6.58	.012	.106	.746	.311	.579
Gathering Information	2.77	.099	1.61	.208	.002	.967

degrees of freedom were (1,88) for all F values

Summary and Conclusions

The overall results of the program data showed that the completion of the Ed.S. degree, the Carnegie Classification of the undergraduate institution, and the master's degree grade point average were useful in predicting doctoral degree completion in educational administration. Of

these, the most significant predictor was conferral of the specialist degree. When the variable of the Ed.S. degree was removed from the regression equation, results differed somewhat from the overall findings. The most predictive factor of completion changed to the Carnegie Classification of the undergraduate institution followed in importance by UGPA, GRE verbal times MGPA, and gender. The overall prediction rate, however, dropped slightly when the specialist degree was eliminated from consideration.

The results of this study suggest that the UGPA should be considered in admitting students to doctoral study. Descriptive data showed that there were differences between the entire subject pool and the group whose UGPA was below ordinary admission requirements. Completely ignoring this factor in admissions deliberations does not make practical sense.

Two of the six general findings of the meta-synthesis of Bair and Haworth (1999) were supported in this study. First, except for GRE scores (GREV times the MGPA) and UGPA, academic achievement indicators were not effective predictors of degree completion; and these variables were only minimally important. Second, attrition was also affected by difficulties with the dissertation. This was true for the institution under current study. Table 1 showed that nearly 28% of the male students who dropped out had passed comprehensive examinations but just under 6% had a formal dissertation proposal approved. For females, the percentages were significantly lower (5.6% and 0%, respectively). Dissertation completion probably influenced the final grade point average since dissertation completion and approval usually results in a grade of "A" for the ten semester hours of credit assigned.

When one wishes to predict which students are most likely to complete the doctoral program in educational administration, variables should be used in combination. Malone, Nelson, and Nelson (2001) found that predictive rates for completion of the master's degree in educational administration increased when the admission factors were used conjunctively. The current study mirrored those results in that no single variable should be used to determine who should be allowed to begin doctoral study.

Investigators also suggest that study should focus on non-quantitative factors to determine the quality of the doctoral program and to assess why students with appropriate admissions credentials fail to persist to degree completion. Results from the survey of doctoral students support this assertion. There was no variance by gender between males and females that completed the Ed.D. degree. As a matter of fact, the only factor in which female respondents and male

respondents differed was "Involvement beyond the classroom". Quite possibly, responses from females may have been influenced by the fact that the vast majority of professors in the department during the period 1986-2000 were male. When gender was removed from consideration, there were differences, however, between those who completed the doctoral degree and those who did not on three of the factors: "Competencies gained"; "Academic learning opportunities"; and, "Departmental participation." This suggests that in addition to a quality academic experience, a residency requirement or some other highly intensive experience may be needed to foster student participation beyond the classroom. This may lead to greater retention in the program and an increase in the graduation rate.

While gender was not a factor in degree completion, differences do exist in the employment and career paths of male and female doctoral students surveyed in this study. A greater percentage of males than females held administrative positions at the superintendent level, both currently and at the time doctoral study began, regardless of degree completion. Males, too, averaged three more years of total administrative experience than females. Females, however, made greater gains in assuming principalships and even surpassed the percentage of males in those positions currently held. And while degree completion is the goal to which doctoral students initially aspire, providing opportunities for the advancement of females into higher administrative positions should also be of major concern.

The investigators suggest that additional study should include input from other stakeholders, e.g., faculty and institutional representatives who are responsible for monitoring cost analysis features of the program and evaluating the success of their graduates.

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Appendix A

Doctoral Survey

Please answer the following questions to the best of your ability in reference to your experience as a doctoral student in the Educational Administration program at Ball State University (BSU). Your participation is completely voluntary and you are free to discontinue the survey at any time.

Part I. Background Information. Please respond to the following items in the space provided.

1. What year did you enter the doctoral program? (for example, 1990) _____
2. What was your age when you entered the doctoral program? _____
3. What was your marital status during the time of your doctoral studies?
   _____I was married during the entire period of my doctoral studies.
   _____I married during my doctoral studies.
   _____I was single the entire period of my doctoral studies.
   _____I divorced during my doctoral studies.
   _____Other; please explain _____
4. How many dependents, for whom you were responsible, lived in your household during the majority of your doctoral studies?_____
5. What was your occupation at the time you began your doctoral studies? (List job title only, for example superintendent, principal, teacher, etc.) _____
6. How many years of teaching experience did you have when you began doctoral study? _____
7. Indicate the levels of teaching experience you had at the time you began doctoral study. (Check all that apply.)
   _____Elementary _____High School
   _____Junior High _____College
8. How many years of administrative experience did you have at the time you began doctoral study? _____
9. Indicate the levels of administrative experience that you had at the time you began doctoral study (Check all that apply.)
   _____Elementary _____High School _____Central Office
   _____Junior High _____College _____Superintendent's Office
10. Check the highest level of education attained by your parents.

Mother

_____High School Diploma
_____Associate Degree in College
_____Bachelor's Degree in College
_____Master's Degree in College
_____Doctoral Degree in College
_____Other _____

Father

_____High School Diploma
_____Associate Degree in College
_____Bachelor's Degree in College
_____Master's Degree in College
_____Doctoral Degree in College
_____Other_____

11. What were the occupations of your parents during the majority of their working lives? (List general job titles or descriptions only.)

    Mother's Occupation_____

    Father's Occupation_____

12. At what point in your educational career did you know you wanted to pursue a doctoral degree in Educational Administration? (Check all that apply.)

    _____I decided as an undergraduate student.
    _____I decided while working on my master's degree.
    _____I decided <u>after</u> completion of my master's degree.
    _____I decided while working in the field of education as a teacher.
    _____I decided while working in the field of education as an administrator.
    _____I decided while working in a field other than education.
    _____Other; please specify_____

<u>Part II</u>. Questions 13-25 pertain to the time period after you began doctoral study.

13. Did you have opportunities to teach at the collegiate level at BSU during your doctoral study Yes_____ No_____
14. Did you participate in research and writing for publication with the professor(s) in your department? Yes_____ No_____
15. Did you use the services of a BSU research design consultant/statistician (other than your dissertation chairperson) to design your study and analyze the data for your dissertation? Yes_____No_____

Please answer Questions 16-23 as they apply to the <u>majority</u> of the time you were a doctoral student.

16. Which statement most accurately describes your employment status as a doctoral student?
    _____I was employed full-time.
    _____I was employed part-time.
    _____I was not employed.
    _____I held an assistantship at BSU. How long? ____1 year ____2 years ____3 years or more

24. Which of the following statements most accurately describes the reason or reasons that you the doctoral degree in Educational Administration at BSU? (Check all that apply.)

I finished the degree because I

_____wanted to attain a particular career goal.
_____wanted to earn a better income.
_____was unwilling to experience failure.
_____wanted the personal satisfaction of completing the degree.
_____faced family pressure to complete the degree.
_____had supportive faculty in my program department.
_____had a supportive committee chairperson.
_____had supportive fellow students.
_____Other; please be specific_____

25. Choose two from the list in Question #24 that were the most significant factors in your completion of the doctoral degree at BSU.

1._____

2._____

<u>Part III</u>. Questions 26-50 pertain to the time period after you began doctoral study. Please circle the response that most closely represents your feelings.

SA=Strongly Agree
A=Agree
NA=Not Applicable
D=Disagree
SD=Strongly Disagree

26. My doctoral student experience prepared me for the demands of my current position. SA A NA D SD
27. The academic rigor of the courses in the program was appropriate for the development of scholarly practitioners of educational leadership. SA A NA D SD
28. I was not satisfied with the amount and quality of time spent with my faculty chairperson. SA A NA D SD
29. Graduate students were treated with respect by the faculty in my major department. SA A NA D SD
30. Interaction with other doctoral students offered me socializing and academic learning opportunities. SA A NA D SD

31. The advice and information I received from faculty in my major department were consistent. SA A NA D SD
32. Graduate students in my major department were encouraged to take an active role in departmental decisions that affected them. SA A NA D SD
33. Faculty in my major department actively involved me in their research. SA A NA D SD

34. Graduate students in my major department were invited to participate in departmental events of an academic nature SA A NA D SD
35. I did not participate in departmental events of an academic nature. SA A NA D SD
36. University library holdings were not adequate to complete the research for my dissertation. SA A NA D SD
37. The majority of the courses required for the major component of my doctoral degree were relevant to my career objective. SA A NA D SD
38. The majority of the courses required for the major component of my doctoral degree were of high quality. SA A NA D SD
39. The majority of the courses outside my major area, i.e., cognate(s), for the doctoral degree were not relevant to my career objective. SA A NA D SD
40. The majority of the courses outside my major area, i.e., cognate(s), for the doctoral degree were of high quality. SA A NA D SD
41. Faculty in the Educational Administration program served as mentors to me. SA A NA D SD
42. I have grown or changed in a positive way as a result of my experiences in the doctoral program. SA A NA D SD
43. As a result of my doctoral study I can independently engage in research or creative projects in my discipline. SA A NA D SD
44. As a result of my doctoral study I can analyze, synthesize, and apply knowledge in my discipline. SA A NA D SD
45. As a result of my doctoral study I am able to communicate effectively in ways that are appropriate to my discipline. SA A NA D SD
46. My statistics and/or research courses did not prepare me to write a dissertation. SA A NA D SD
47. As a result of my doctoral study I am knowledgeable of essential information in my discipline. SA A NA D SD
48. As a result of my doctoral study I am committed to the professional and ethical standards of my discipline. SA A NA D SD
49. The academic ability of fellow students in the doctoral program was strong. SA A NA D SD
50. If I were to begin a doctoral program again, I would not select Educational Administration as my major area of study. SA A NA D SD

Part IV. Employment Information. Please respond to the following questions in the space provided.

51. What was your occupation immediately upon receiving the doctoral degree in Educational Administration from BSU? (List job title only, for example, principal, superintendent, etc.) _____
52. List the state in which the above job was located. _____ (e.g., Indiana)

	Factor 6	Factor 7
ITEM45	.13223	-.01519
ITEM44	.08042	-.01450
ITEM43	.16519	.15366
ITEM42	.11109	.02164
ITEM48	.02169	.07753
ITEM38	.07575	.01109
ITEM47	.03047	-.05368
ITEM37	.02338	-.06383
ITEM27	.21748	.02786
ITEM49	.24375	.14393
ITEM29	-.07574	.37250
ITEM41	-.04099	.22444
ITEM33	.31962	.11776
ITEM26	-.19215	.06478
ITEM32	.20160	.30500
ITEM50	-.08232	-.23800
ITEM46	-.06290	.09028
ITEM28	-.16358	-.33184
ITEM30	.19589	.11875
ITEM40	.14716	-.07918
ITEM39	.00903	-.06244
ITEM35	-.81658	-.09414
ITEM34	.72979	.09347
ITEM36	-.11989	-.51342
ITEM31	.00616	.46739

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